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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/791,300	03/01/2004	Chien-Min Sung	22268	3512

20551 7590 03/08/2007

THORPE NORTH & WESTERN, LLP.
8180 SOUTH 700 EAST, SUITE 200
SANDY, UT 84070

EXAMINER	
ELEY, TIMOTHY V	
ART UNIT	PAPER NUMBER
3724	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/08/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/791,300	SUNG, CHIEN-MIN	
	Examiner	Art Unit	
	Timothy V. Eley	3724	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 November 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,5-20,22-34 and 36-42* is/are pending in the application.

4a) Of the above claim(s) *22 and 36* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,5-20,23-30,34 and 37-42* is/are rejected.

7)☒ Claim(s) *31-33* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/7/04,10/7/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. Applicant should update the parent information for United States Patent Application 10/259168 in the first paragraph of the specification.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1,3,5,6,8,13,17-19,23-25,27,29,30,34,37,38, and 42 are rejected under 35 U.S.C. 102(b) as being anticipated by Davies et al(5,772,756).

- Davies et al discloses a method for controlling nucleation sites during superabrasive particle synthesis, comprising the steps of: a)forming a raw material layer(20) including a raw material; b)forming a particulate catalyst layer(18) adjacent the raw material layer to form a crystal growth layer, the particulate catalyst layer including a catalyst material; and c)placing crystalline seeds in a predetermined pattern at least partially in at least one of the catalyst layer and the raw material layer to form a growth precursor. See figure 1, and column 3, lines 1-26.

- Regarding claim 1, Davies et al does not specifically state that the catalyst layer a particulate layer. However, applicant states that "particulate" can denote packed particles, and therefore, the mass(18) may be considered to be a "particulate".
- Regarding claim 3, the catalyst layer(18) consists essentially of catalyst material. See column 3, lines 14-16.
- Regarding claim 5, the superabrasive particle is diamond and the raw material is a carbon source. See column 3, lines 20-26.
- Regarding claim 6, the catalyst material is a member selected from the group consisting of Fe, Ni, Co, Mn, Cr, and alloys thereof. See column 3, lines 56 and 57.
- Regarding claim 8, the carbon source is graphite. See column 3, lines 17 and 18.
- Regarding claim 13, the seed is diamond seed. See column 3, line 1.
- Regarding claim 17, the seeds are placed in the catalyst layer.
- Regarding claim 18, the seeds are substantially surrounded with catalyst material.
- Regarding claim 19, a second layer(22) catalyst material is placed on the first catalyst layer.
- Regarding claim 23, them method further comprises the steps of heating and pressing the growth precursor. See column 3, lines 27-45.

- Regarding claim 24, the temperature is from about 1000°C to about 1300°C and the pressure is from about 4 to about 7 GPa. See column 3, lines 55-60.
- Regarding claim 25, the temperature is inherently from about 10°C to about 200°C above a melting point of the catalyst.
- Regarding claim 27, the seeds are from about 30 microns to about 50 microns in diameter. See column 3, lines 51 and 52.
- Regarding claim 29, the superabrasive particles have a particle size from about 100 microns to about 2 mm. See column 3, lines 60-63.
- Regarding claim 30, the superabrasive particles have a particle size from about 210 microns to about 1 mm. See column 3, lines 60-63.
- Regarding claim 34, Davies et al discloses a growth precursor, comprising at least one crystal growth layer having a raw material layer(20) and a particulate catalyst layer(18), said catalyst layer having a plurality of crystalline seeds(24) placed in a predetermined pattern.
- Regarding claim 37, the raw material is a carbon source(as stated above).
- Regarding claim 38, the catalyst material is selected from the recited group(as stated above).
- Regarding claim 42, the seed is diamond seed.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1,3,5-7,8,13,17-20,23-30,34,37,38, and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davies et al(5,772,756) in view of Davies et al(6,835,365).

- Davies et al(5,772,756) is explained above.
- In the event that Davies et al(5,772,756) is considered to not disclose a particulate catalyst layer, Davies et al(6,835,365) discloses that it is well known in the art to use a catalyst in a particulate form. See column 4, lines 27-30.
- Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the Davies et al(5,772,756) method and product, by using a particulate catalyst layer, as taught by Davies et al(6,835,365) in order to provide for easier insertion of the catalyst into the precursor.
- Regarding claim 7, Davies et al(5,772,756) discloses that it is well known to use a an iron/nickel(Fe-Ni) alloy as the catalyst. However, Davies et al does not disclose the exact composition of the alloy. The exact composition of the alloy would have been obvious to one having ordinary skill in the art at the time the

invention was made since such would depend upon numerous factors, such as, the desired size/consistency of the diamond, the rate of manufacture of the diamond, etc., and applicant has not stated that the exact composition of the alloy provides any stated advantage over the prior art.

- Regarding claim 20, whether or not the seed is completely pressed into the catalyst layer would have been obvious to one having ordinary skill in the art at the time the invention was made since clearly the seed much eventually be completely surrounded by the catalyst layer in order to adequately manufacture the diamond.
- Regarding claim 26, the average diameter size of the crystalline seeds in relation to the grown superabrasive particles would have been an obvious matter of choice to one having ordinary skill in the art at the time the invention was made since choosing different seed sizes and final sizes is well within the ordinary skill of an artisan in the art.
- Regarding claim 28, Davies et al(5,772,756) discloses that the seeds are spaced from each other in order to allow controlled diamond growth to occur on each seed crystal. See column 3, lines 1 and 2. Therefore, the exact distance between the seeds would have been an obvious matter of choice to one having ordinary skill in the art at the time the invention was made since the seeds should be spaced only enough in order to allow

controlled diamond growth to occur on each seed crystal, as taught by Davies et al(5,772,756).

6. Claims 9,10, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davies et al(5,772,756) in view of Davies et al(6,835,365), as applied to claims above, and further in view of Murakami et al(4,749,514).

- Davies et al(5,772,756) in view of Davies et al(6,835,365) is explained above.
- Davies et al(5,772,756), as modified, does not disclose that the graphite has a degree of graphitization of greater than 0.50.
- Murakami et al discloses that graphite inherently has a high degree of graphitization, and is used for diamond synthesis. See column 2, lines 1-5, and 11-27.
- Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a graphite having a high degree of graphitization as disclosed by Murakami et al in order to optimized the diamond synthesis process. The exact value of the degree of graphitization would have been an obvious matter of choice to one having ordinary skill in the art at the time the invention was made, so long as the process is optimized.

7. Claims 11,12,40, and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davies et al(5,772,756) in view of Davies et

al(6,835,365), as applied to claims above, and further in view of Fries et al(6,979,357).

- Davies et al(5,772,756) in view of Davies et al(6,835,365) is explained above.
- Regarding claims 11 and 40, Davies et al(5,772,756), as modified does not disclose a superabrasive particle that is cubic boron nitride and a raw material which is a hexagonal boron nitride source, both being used for particle synthesis.
- Fries et al discloses that it is well known to use a superabrasive particle that is cubic boron nitride and a raw material that is a hexagonal boron nitride source in a superabrasive synthesis process. See column 2, lines 54-56.
- Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have further modified the method of Davies et al(5,772,756) by using a superabrasive particle that is cubic boron nitride and a raw material that is a hexagonal boron nitride source, as taught by Fries et al, in order to reduce costs.
- Regarding claims 12, and 41, Davies et al(5,772,756), as modified, does not disclose using a catalyst material that is an alkali, alkali earth metal, and components thereof.
- However, Davies et al(6,835,365) discloses that it is well known in the art to use an alkali, alkali earth metal, and components

thereof as the raw material in a superabrasive particle synthesis process. See column 3, lines 55-63.

- Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have further modified the method of Davies et al(5,772,756) by using an alkali, alkali earth metal, and components thereof as the raw material, as taught by Davies et al(6,835,365), in order to reduce costs.

8. Claims 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davies et al(5,772,756) in view of Davies et al(6,835,365) as applied to claims above, and further in view of Degawa et al(5,980,982).

- Davies et al(5,772,756) in view of Davies et al(6,835,365) is explained above.
- Davies et al(5,772,756), as modified, does not disclose coating the seeds with a catalyst coating.
- However, Degawa et al discloses coating seeds in particle synthesis. See column 2, lines 37-42.
- Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have further modified the method of Davies et al(5,772,756) by coating the seeds with a catalyst coating, as taught by Degawa et al, in order to enhance the synthesis process.

- Regarding claim 15, Davies et al(5,772,756) discloses a particulate source layer. See column 3, lines 17 and 18.
- Regarding claim 16, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the catalyst coating out of the same material as the rest of the catalyst material.

Allowable Subject Matter

9. Claims 31,32, and 33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- The cited prior art discloses superabrasive particle synthesis processes.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy V. Eley whose telephone number is 571-272-4506. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Boyer D. Ashley can be reached on 571-272-4502. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Timothy V Eley
Primary Examiner
Art Unit 3724

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